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Edited by I. Chajda, G. Dorfer, G. Eigenthaler, R. Halaš, J. Kühn
W. B. Müller

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List of Abstracts

Mike Behrisch, Edith Mireya Vargas

C-Clones and C-Automorphism Groups

ABSTRACT. In this paper a restricted version of the Galois connection between polymorphisms and invariants, called $\text{Pol} - C\text{Inv}$, is studied, where the invariant relations are restricted to so-called clausal relations. The lattice of all clones arising from this Galois connection, so-called C -clones, is investigated up to equality of their unary bijective parts, which are denominated C -automorphism groups. Using a further restricted Galois connection $\text{Aut} - C\text{Inv}$ between permutation groups and clausal relations, it is shown that the lattice of all C -automorphism groups on a finite set D is Boolean with $|D| - 1$ atoms.

Jānis Buls, Edmunds Cers

Distributivity in the Semilattice of ω -Words

ABSTRACT. A partial ordering of ω -words can be introduced with regard to whether an ω -word can be transformed into another by a Mealy machine. It is known that the poset of ω -words that is introduced by this ordering is a join-semilattice of continuum width and at least denumerable depth. We show that this join-semilattice is not distributive.

Ivan Chajda, Günther Eigenthaler

A Polynomial Representation of Bounded Lattices with an Antitone Involution

ABSTRACT. We show that any bounded lattice with an antitone involution can be represented by a given set of binary polynomials where the operations are certain compositions of functions.

Ivan Chajda, Helmut Länger

Genomorphisms of Monounary Algebras

ABSTRACT. Genomorphisms are generalizations of homomorphisms between algebras of different type. They are applied in Theoretical Computer Science. Since monounary algebras are also used in Computer Science, it is natural to investigate genomorphisms between monounary algebras. Since every genomorphism is a composition of a homomorphism and an isogenomorphism and, moreover, homomorphisms between monounary algebras were already described in the literature we concentrate on isogenomorphic images of monounary algebras.

Jānis Cīrulis

Skew Nearlattices: Some Structure and Representation Theorems

ABSTRACT. A nearlattice is a meet semilattice in which every principal order ideal is a lattice. Roughly, a skew nearlattice is a nearlattice with non-commutative meet operation; in particular, a skew nearlattice is said to be right normal (an rns-nearlattice, in short) if a weakened commutative law $xyz = yxz$ holds. (Thus, rns-nearlattices are just right normal bands having the upper bound property.) We characterise the structure of rns-nearlattices and prove certain representation theorems for such algebras. In particular, every distributive rns-nearlattice is shown to be isomorphic to an algebra of partial functions of the kind $(A, \cup, \overleftarrow{\cap})$ with the operation $\overleftarrow{\cap}$ defined as follows: $(\varphi \overleftarrow{\cap} \psi)(i) = v$ iff $i \in \text{dom } \varphi \cap \text{dom } \psi$ and $\psi(i) = v$.

Gábor Czédli, E. Tamás Schmidt

Some Results on Semimodular Lattices

ABSTRACT. Some recent results on semimodular lattices are surveyed, and some related results are given. The topics include a strong form of the Jordan-Hölder theorem, the semimodularity of subdirect products, representations as cover-preserving join-homomorphic images of distributive lattices, cover-preserving embeddings into geometric lattices, and the congruence lattices of finite almost-geometric lattices.

Klaus Denecke, Jörg Koppitz

M-Solid Positive Varieties of Tree Languages

ABSTRACT. We prove a variety theorem which connects M -solid positive varieties of tree languages with M -solid ordered pseudovarieties and with M -solid varieties of filters of congruences.

Daniela Guffová, Miroslav Haviar

Lattices with Relative Stone Congruence Lattices

ABSTRACT. We give a new characterization of lattices with relative Stone congruence lattices and we generalize, within the subvarieties of relative Stone Heyting algebras, a characterization of G. Grätzer and E.T. Schmidt of lattices with Boolean congruence lattices.

Alexander Guterman, Graça Soares

Additive Frobenius Endomorphisms for Sylvester and Related Bounds

ABSTRACT. We characterize additive Frobenius endomorphisms for the extremal sets related to the Sylvester bounds for the rank of matrix product.

Emília Halušková

Several Inverse Limit Closed Classes of Algebras

ABSTRACT. In this paper classes of algebras which are closed with respect to inverse limits are studied. We prove that the class of all retracts of a finite algebra is a class with this property. Further, we deal with some inverse limit closed classes, which are determined by term operations.

Danica Jakubíková–Studenovská, Mária Petrejčíková

On Invariance of Monounary Algebras

ABSTRACT. An algebra is called fully invariant with respect to congruences (quasiorders), if each endomorphism respects all congruences (quasiorders); shortly CFI (QFI). If, instead of endomorphisms, only retraction endomorphisms are considered, an algebra is said to be CRI (QRI). We characterize all monounary algebras which are QFI (CFI, QRI, CRI, respectively). In particular, it is shown that if a monounary algebra is connected, then these notions are equivalent.

Milan Jaseň

Weak Relatively Uniform Convergence in Riesz Groups

ABSTRACT. In this paper the notion of a weak relatively uniform convergence in Riesz groups is introduced and basic properties of this convergence in isolated abelian Riesz groups are investigated. Further, a Cauchy completion of an isolated abelian Riesz group is found.

Sebastian Kerkhoff

The Essential Arity of Clones over Algebras

ABSTRACT. In [3], it was shown that clones can be dualized categorically by treating them as a set of morphisms in a category. In this setting, there exists a relational structure \mathbf{X} in a category \mathcal{X} such that every n -ary operation in the clone dualizes to a structure preserving mapping from \mathbf{X} to $n \cdot \mathbf{X}$, where the latter is the n -th copower of \mathbf{X} in \mathcal{X} . This copower can have a very complicated form, but its structure tells a lot about the properties of the dualized clone. In this paper, we show that the question of whether the essential arity of a clone is bounded can be fully answered by looking at how the copowers of \mathbf{X} are built.

Michiro Kondo

Commutative Residuated Lattices with $(x \odot y)' = x' \vee y'$

ABSTRACT. We consider bounded commutative residuated lattices with the strictness axiom $(x \odot y)' = x' \vee y'$, simply denoted by SRL, where $x' = x \rightarrow 0$, and prove that for any strict bounded commutative residuated lattice L , $L^* = \{x' \mid x \in L\}$ is a Boolean algebra, and L is simple if and only if the unit e is an atom of L , that is, there is no element x such that $0 < x < e$.

Xianhua Li, Ailing Nan

The Structure of Finite Groups and the θ -Pairs of Subgroups

ABSTRACT. Using the concept of θ -pairs of proper subgroups of a finite group we obtain criteria for supersolvability and nilpotency. This generalizes our previous results.

Aditya Nagrath

Jumpy Lattices

ABSTRACT. We say that a lattice L contains a jump if there are $a, b \in L$ so that $a \prec b$. L is said to be jumpy if all of its nontrivial homomorphic images have a jump. If L is Boolean, then every covering relationship $a \prec b$ in L is associated with its atom $b \setminus a$, so that a Boolean algebra is jumpy if and only if it is superatomic. We show that an arbitrary bounded distributive lattice is jumpy if and only if its Boolean reflection is superatomic if and only if its Priestley space is scattered. The class of jumpy lattices is closed under sublattices, homomorphic images (quotient lattices), and weak direct products.

A classical result of Day characterizes superatomic Boolean algebras as those which admit a reflection into complete Boolean lattices. The corresponding property for bounded distributive lattices would be a reflection into doubly algebraic lattices. We show that jumpy lattices admit such a reflection, but that this property does not characterize them.

Jan Paseka

A Remark on a Paper of van Alten

ABSTRACT. In his paper “The finite model property for knotted extensions of propositional linear logic” van Alten shows that both the classical and intuitionistic propositional versions of Girard’s Linear Logic, when extended by a *knotted structural rule* $\frac{\Gamma, x^n \Rightarrow y}{\Gamma, x^m \Rightarrow y}$, have the finite model property. The purpose of this remark is to show that quantized versions of these logics extended by a knotted structural rule have also the finite model property.

Miroslav Ploščica

Congruence Preserving Functions on Median Algebras

ABSTRACT. Affine completeness and local affine completeness for median algebras has been characterized by H. J. Bandelt [1] and M. Ploščica [10]. In this paper we take a more general approach and try to describe the clone of all congruence preserving functions on median algebras which are not necessarily (locally) affine complete. We define several types of congruence preserving functions and conjecture that every congruence preserving function is a composition of functions of these types. We are able to confirm this conjecture in the unary case.

An analogous problem has been recently solved for distributive lattices (see [11]), so we try to apply similar methods.

Sergey A. Solovyov

Categorically-Algebraic Frameworks for Priestley Duality

ABSTRACT. The paper considers a fuzzification of the topological representation theorem for bounded distributive lattices of H. Priestley. The new machinery is developed in the framework of categorically-algebraic topology, and incorporates both the theory of H. Priestley and the sobriety-spatiality approach to the representation theories of M. Stone in the sense of P. Johnstone, as well as generalizes certain natural dualities of B. Davey.